

SUBSTITUTE SPECIFICATION

ABSTRACT OF THE DISCLOSURE

[0071] A phased array for controlling a radiation pattern of an array of antennas includes a plurality of antenna ports, a first tunable element connected in series between each respective pair of adjacent antenna ports, and a second tunable element connected in parallel with each respective antenna port. The phased array provides progressive phase differences between successive antenna ports. Equal amplitude of the signal can be maintained at each antenna. An equal amount of successive phase change can be provided in a signal at each antenna. A direct current source connectible to at least one input port can include an alternating power source through a matching circuit, such as a quarter-wave transformer. The first and second tunable elements can be either an inductor or a capacitor, and/or can be in combination with transmission lines separating each respective antenna from a successive antenna by desired fraction of a wavelength.